THEREFORE, WE CLAIM:

1. A composition formed from components comprising:

(a) at least one polysiloxane comprising at least one reactive functional group;

(b) at least one reactant comprising at least at least one functional group that is reactive with at least one functional group selected from the at least one reactive functional group of the at least one polysiloxane and at least one functional group of at least one reactant; and

(c) a plurality of particles selected from inorganic particles, composite particles, and mixtures thereof,

wherein each component is different, and

wherein the at least one reactive functional group of the at least one polysiloxane is substantially nonreactive with the particles.

2. A composition according to claim 1, wherein each at least one reactive functional group of the at least one polysiloxane, which may be identical or different, is selected from a hydroxyl group, a carboxyl group, an isocyanate group, a blocked polyisocyanate group, a primary amine group, a secondary amine group, an amide group, a carbamate group, a urea group, a urethane group, a vinyl group, an unsaturated ester group, a maleimide group, a fumarate group, an anhydride group, a hydroxy alkylamide group, and an epoxy group.

3. A composition according to claim 1, wherein the at least one polysiloxane comprises at least two reactive functional groups.

4. A composition according to claim 1, wherein each at least one reactive functional group of the at least one polysiloxane, which may be identical or different, comprises at least one reactive functional group selected from a hydroxyl group, a carbamate group, an epoxy group, a carboxyl group, and a carbamate group.

5. A composition according to claim 4, wherein each at least one reactive functional group of the at least one polysiloxane, which may be identical or different, comprises at least two reactive functional groups selected from a hydroxyl group, and a carbamate group.

6. A composition according to claim 4, wherein each at least one reactive functional group of the at least one polysiloxane, which may be identical or different, comprises an oxyalkylene group and at least two hydroxyl groups.

7. A composition according to claim 1, wherein the at least one polysiloxane, when added to the other components of the composition, is present in the composition in an amount ranging from 0.01 to 90 weight percent based on total weight of the resin solids of the components which form the composition.

8. A composition according to claim 7, wherein the at least one polysiloxane is present in an amount of at least 2 weight percent.

9. A composition according to claim 8, wherein the at least one polysiloxane is present in an amount of at least 5 weight percent.

10. A composition according to claim 9, wherein the at least one polysiloxane is present in an amount of at least 10 weight percent.

11. A composition according to claim 1, wherein the particles are selected from fumed silica, amorphous silica, colloidal silica, alumina, colloidal alumina, titanium dioxide, cesium oxide, yttrium oxide, colloidal yttria, zirconia, colloidal zirconia, and mixtures of any of the foregoing.

12. A composition according to claim 1, wherein the particles are surface treated.

13. A composition according to claim 1, wherein the particles include colloidal silica.

14. A composition according to claim 1, wherein the particles have an average particle size less than 100 microns prior to incorporation into the composition.

15. A composition according to claim 14, wherein the particles have an average particle size less than 50 microns prior to incorporation into the composition.

16. A composition according to claim 1, wherein the particles have an average particle size ranging from 1 to less than 1000 nanometers prior to incorporation into the composition.

17. A composition according to claim 16, wherein the particles have an average particle size ranging from 1 to 100 nanometers prior to incorporation into the composition.

18. A composition according to claim 17, wherein the particles have an average particle size ranging from 5 to 50 nanometers prior to incorporation into the composition.

19. A composition according to claim 1, wherein the particles, when added to the other components that form the composition, are present in the composition in an amount ranging from 0.01 to 75 weight percent based on total weight of the resin solids of the components which form the composition.

20. A composition according to claim 19, wherein the particles are present in an amount of at least 0.1 weight percent.

21. A composition according to claim 20, wherein the particles are present in an amount of at least 0.5 weight percent.

22. A composition according to claim 21, wherein the particles are present in an amount of at least 5 weight percent.

23. A composition according to claim 1, wherein the particles are present in an amount of less than 20 weight percent.

24. A composition according to claim 1, wherein the particles are present in an amount of less than 10 weight percent.

25. A composition according to claim 1, wherein the at least one reactant is selected from at least one curing agent.

26. A composition according to claim 25, wherein the at least one curing agent is selected from an aminoplast resin, a polyisocyanate, a blocked polyisocyanate, a polyepoxide, a polyacid, and a polyol.

27. A composition according to claim 25, wherein the at least one curing agent is selected from an aminoplast resin and a polyisocyanate.

28. A composition according to claim 25, wherein the curing agent, when added to the other components that form the composition, is present in an amount ranging from 1 weight percent to 65 weight percent based on total weight of the resin solids of the components which form the composition.

29. A composition according to claim 28, wherein the curing agent is present in an amount of at least 5 weight percent.

30. A composition according to claim 28, wherein the curing agent is present in an amount of at least 10 weight percent.

31. A composition according to claim 1, wherein the components which form the composition comprise at least one film-forming material different from (a).

32. A composition according to claim 31, wherein the at least one film-forming material comprises a polymer comprising at least one functional group, said polymer being in addition to and different from said at least one polysiloxane.

33. A composition according to claim 32, wherein the at least one reactive functional group of the at least one polymer is selected from a hydroxyl group, a carboxyl group, an isocyanate group, a blocked polyisocyanate group, a primary amine group, a secondary amine group, an amide group, a carbamate group, a urea group, a urethane group, a vinyl group, an unsaturated ester group, a maleimide group, a fumarate group, an anhydride group, a hydroxy alkylamide group, and an epoxy group.

34. A composition according to claim 32, wherein the at least one reactive functional group of the at least one polymer is selected from a hydroxyl group and a carbamate group.

35. A composition according to claim 1, wherein the components which form the composition comprise at least one catalyst.

36. A composition according to claim 35, wherein the at least one catalyst is present in an amount sufficient to accelerate the reaction between the at least one functional group of the at least one reactant and the at least one reactive functional group of the at least one polysiloxane.

37. A composition according to claim 35, wherein the at least one catalyst is an acid catalyst.

38. A composition according to claim 35, wherein the at least one catalyst is selected from an acid phosphate, a substituted sulfonic acid, and an unsubstituted sulfonic acid.

39. A composition according to claim 38, wherein the at least one catalyst is phenyl acid phosphate.

40. A composition according to claim 1, wherein the components which form the composition comprise at least one surface active agent.

41. A composition according to claim 40, wherein the at least one surface active agent is selected from an anionic surface active agent, a nonionic surface active agent, a cationic surface active agent, and mixtures of any of the foregoing.

42. A composition according to claim 1, wherein the at least one polysiloxane has at least one of the following structural units (I) :

(I) $R^1_nR^2_mSiO_{(4-n-m)/2}$

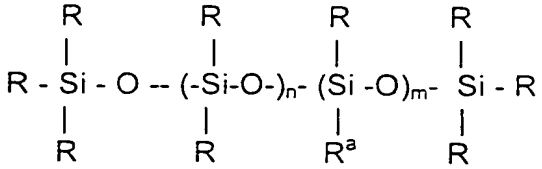
wherein each R^1, which may be identical or different, represents H, OH, or a monovalent hydrocarbon group; each R^2, which may be identical or different, represents a group comprising at least one reactive functional group; wherein m and n fulfill the requirements of $0<n<4$, $0<m<4$ and $2\leq(m+n)<4$.

43. A composition according to claim 42, wherein each R^2 represents a group comprising at least one reactive functional group selected a hydroxyl group, a carboxyl group, an isocyanate group, a blocked polyisocyanate group, a primary amine group, a secondary amine group, an amide group, a carbamate group, a urea group, a urethane group, a vinyl group, an unsaturated ester group, a maleimide group, a fumarate group, an anhydride group, a hydroxy alkylamide group, and an epoxy group.

44. A composition according to claim 43, wherein represents a group comprising at least one reactive functional group selected from a hydroxyl group, a carbamate group, a carboxyl group, and an epoxy group.

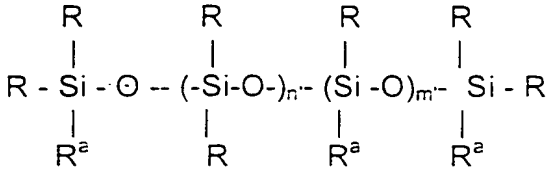
45. A composition according to claim 1, wherein the at least one polysiloxane has the following structure (II) or (III):

(II)



or

(III)



wherein:

m has a value of at least 1;

m' ranges from 0 to 75;

n ranges from 0 to 75;

n' ranges from 0 to 75;

each R, which may be identical or different, is selected from H, OH, monovalent hydrocarbon groups, and mixtures of any of the foregoing; and

each R^a, which may be identical or different, comprises the following structure (IV):

(IV) $-R^3-X$

wherein each $-R^3$, which may be identical or different, is selected from an alkylene group, an oxyalkylene group, an alkylene aryl group, an alkenylene group, an oxyalkenylene group, and an alkenylene aryl group; and

each X, which may be identical or different, represents a group which comprises at least one reactive functional group selected from a hydroxyl group, a carboxyl group, an isocyanate group, a blocked polyisocyanate group, a primary amine group, a secondary amine group, an amide group, a carbamate group, a urea group, a urethane group, a vinyl group, an unsaturated ester group, a maleimide group, a fumarate group, an anhydride group, a hydroxy alkylamide group, and an epoxy group.

46. A composition according to claim 45, wherein (n + m) ranges from 2 to 9.

47. A composition according to claim 45, wherein (n' + m') ranges from 2 to 9.

48. A composition according to claim 46, wherein (n + m) ranges from 2 to 3.

49. A composition according to claim 47, wherein (n' + m') ranges from 2 to 3.

50. A composition according to claim 45, wherein each X, which may be identical or different, represents a group comprising at least one reactive functional group selected from a hydroxyl group and a carbamate group.

51. A composition according to claim 45, wherein each X, which may be identical or different, represents a group comprising at least two hydroxyl groups.

52. A composition according to claim 45, wherein each X, which may be identical or different, represents a group comprising at least one substituent selected from H, a monohydroxy-substituted group and a group having the following structure (V):

(V) $R^4\text{-}(CH_2\text{-}OH)_p$

wherein R^4 is $-CH_2-\underset{|}{\overset{|}{C}}-R^3$ when p is 2 and R^3 is C_1 to C_4 alkyl, or

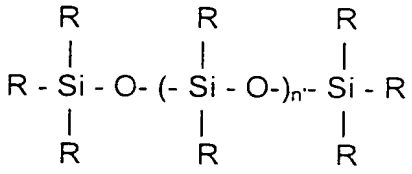
R^4 is $-CH_2-\underset{|}{\overset{|}{C}}-$ when p is 3,

wherein a portion of X is a group having the structure (V).

53. A composition according to claim 52, wherein m is 2 and p is 2.

54. A composition according to claim 1, wherein the polysiloxane (a) is the reaction product of at least the following reactants:

(i) at least one polysiloxane of the formula (VI):

(VI)


wherein each substituent group R, which may be identical or different, represents a group selected from H, OH, a monovalent hydrocarbon group, and mixtures of any of the foregoing; at least one of the groups represented by R is

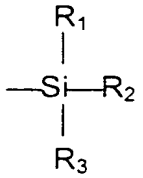
H, and n' ranges from 0 to 100, such that the percent of SiH content of the polysiloxane ranges from 2 to 50 percent; and

(ii) at least one molecule which comprises at least one functional group selected from a hydroxyl group, a carboxyl group, an isocyanate group, a blocked polyisocyanate group, a primary amine group, a secondary amine group, an amide group, a carbamate group, a urea group, a urethane group, a vinyl group, an unsaturated ester group, a maleimide group, a fumarate group, an anhydride group, a hydroxy alkylamide group, and an epoxy group and at least one unsaturated bond capable of undergoing a hydrosilylation reaction.

55. A composition according to claim 54, wherein the at least one functional group is selected from hydroxyl groups.

56. A composition according to claim 1, wherein the components from which the composition is formed comprise at least one material which has at least one material which has at least one reactive functional group which is blocked with a silyl group.

57. A composition according to claim 56, wherein the silyl blocking group has the following structure (IX):

(IX) 

wherein each R_1, R_2 and R_3, which may be identical or different, is selected from hydrogen, an alkyl group comprising from 1 to 18 carbon atoms, a phenyl group and an allyl group.

58. A composition according to claim 56, wherein the at least one reactive functional group is selected from a hydroxyl group and a carboxyl group.

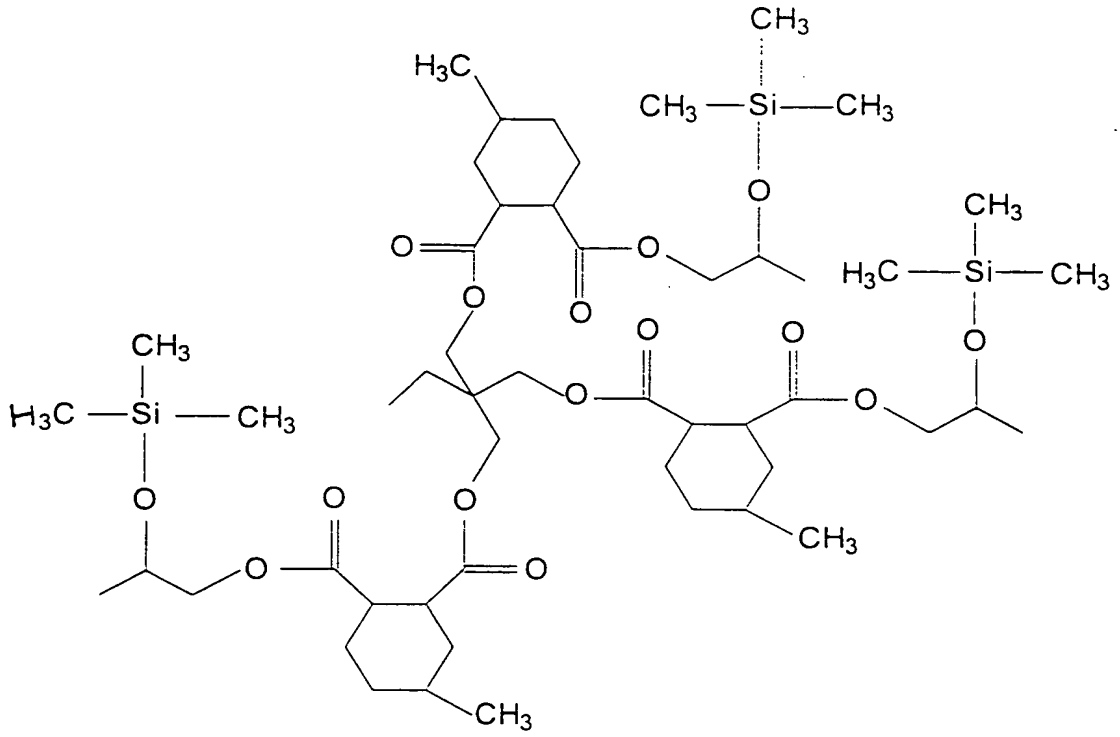
59. A composition according to claim 56, wherein the compounds which can be reacted with the functional group to form the silyl group are selected from hexamethyldisilazane, trimethylchlorosilane, trimethylsilyldiethylamine, t-butyl dimethylsilyl chloride, diphenyl methylsilyl

chloride, hexamethyl disilylazide, hexamethyl disiloxane, trimethylsilyl triflate, hexamethyldisilyl acetamide and mixtures of any of the foregoing.

60. A composition according to claim 56, wherein the at least one material comprises at least one linkage selected from an ester linkage, a urethane linkage, a urea linkage, an amide linkage, a siloxane linkage, and an ether linkage.

61. A composition according to claim 56, wherein the at least one material comprises at least one compound having the following structure (X):

(X)



62. A composition according to claim 1, wherein the composition when cured has an initial scratch resistance value such that after scratch testing greater than 50 percent of the initial 20° gloss is retained.

63. A composition according to claim 1, wherein the composition when cured has an initial scratch resistance value such that after scratch testing greater than 40 percent of the initial 20° gloss is retained.

64. A composition according to claim 1, wherein the composition when cured has a retained scratch resistance value such that after scratch testing greater than 30 percent of the initial 20° gloss is retained.

65. A composition according to claim 1, wherein the composition when cured has a retained scratch resistance value such that after scratch testing greater than 40 percent of the initial 20° gloss is retained.

66. A composition according to claim 1, wherein the composition

when cured has a concentration of particles within a surface region thereof which is greater than a concentration of particles within a bulk region thereof.

67. A cured coating formed from the composition according to claim 1.

68. A cured coating according to claim 67, wherein the cured composition is thermally cured.

69. A cured coating according to claim 67, wherein the cured composition is cured by exposure to ionizing radiation.

70. A cured coating according to claim 67, wherein the cured composition is cured by exposure to actinic radiation.

71. A cured coating according to claim 67, wherein the cured composition is cured by exposure to (1) ionizing radiation or actinic radiation and (2) thermal energy.

72. A coated substrate comprising a substrate and a composition according to claim 1 deposited over at least a portion of the substrate.

73. A method for forming a cured coating on a substrate comprising applying over at least a portion of the substrate a coating composition according to claim 1.

74. A method according to claim 73, wherein the coating composition is thermally cured after application to the substrate.

75. A method according to claim 73, wherein the substrate is an automotive substrate.

76. A coated automobile substrate comprising an automobile substrate and a composition according to claim 1 deposited over at least a portion of the automobile substrate.

77. A coated automobile substrate according to claim 76, wherein the automobile substrate is a bumper.

78. A coated automobile substrate according to claim 76, wherein the automobile substrate is a hood.

79. A coated automobile substrate according to claim 76, wherein the automobile substrate is a door.

80. A coated automobile substrate according to claim 76, wherein the

automobile substrate is a fender.

81. A coated automobile substrate according to claim 76, wherein the automobile substrate is a mirror housing.

82. A multi-component composite coating composition comprising a basecoat deposited from a pigmented coating composition, and a composition according to claim 1 applied over at least a portion of the basecoat.

83. A multi-component composite according to claim 82, wherein the cured composition is a topcoat.

84. A multi-component composite according to claim 82, wherein the cured composition is transparent.

85. A method for making a multi-component composite comprising:

(a) applying a pigmented composition to a substrate to form a basecoat;

(b) applying a composition according to claim 1 over at least a portion of the basecoat; and

(c) curing the composition to form a cured composition.

86. A method according to claim 85, wherein the coating composition is thermally cured after application to the substrate.

87. A method according to claim 85, wherein the coating composition is cured by exposure to ionizing radiation after application to the substrate.

88. A method according to claim 85, wherein the coating composition is cured by exposure to actinic radiation after application to the substrate.

89. A method according to claim 85, wherein the coating composition is cured by exposure to exposure to (1) ionizing radiation or actinic radiation and (2) thermal energy after application to the substrate.

90. A method for improving the scratch resistance of a polymeric substrate or polymer coated substrate comprising applying a composition according to claim 1 over at least a portion of the substrate.

91. A method for retaining the gloss of a polymeric substrate or polymer coated substrate over a predetermined period of time comprising applying a composition according to claim 1 over at least a portion of the substrate.

92. A method for revitalizing the gloss of a polymeric substrate or polymer coated substrate comprising applying a composition according to claim 1 over at least a portion of the substrate.

93. A composition formed from components comprising:

(a) at least one polysiloxane comprising at least one reactive functional group;

(b) at least one reactant comprising at least one functional group that is reactive with at least one functional group selected from the at least one reactive functional group of the at least one polysiloxane and at least one functional group of at least one reactant; and

(c) a plurality of particles,

wherein each component is different,

wherein the at least one reactive functional group of the at least one polysiloxane is substantially nonreactive with the particles, and

wherein a retained scratch resistance value of the composition when cured is greater than a retained scratch resistance value of a composition when cured that does not contain the plurality of particles.

94. A composition according to claim 93, wherein the composition when cured has an initial scratch resistance value such that after scratch testing greater than 50 percent of the initial 20° gloss is retained.

95. A composition according to claim 93, wherein the composition when cured has a retained scratch resistance value such that after scratch testing greater than 40 percent of the initial 20° gloss is retained.

96. A composition according to claim 93, wherein the composition when cured has a concentration of particles within a surface region thereof which is greater than a concentration of particles within a bulk region thereof.

97. A cured coating formed from the composition according to claim 93.

98. A coated substrate comprising a substrate and a composition according to claim 93 deposited over at least a portion of the substrate.

99. A method for forming a cured composition on a substrate comprising applying over at least a portion of the substrate a composition

according to claim 93, and curing the composition after application to the substrate.

100. A method according to claim 99, wherein the coating composition is thermally cured after application to the substrate.

101. A method according to claim 99, wherein the substrate is an automotive substrate.

102. A coated automobile substrate comprising an automobile substrate and a composition according to claim 93 deposited over at least a portion of the automobile substrate.

103. A coated automobile substrate according to claim 99, wherein the automobile substrate is a bumper.

104. A coated automobile substrate according to claim 99, wherein the automobile substrate is a hood.

105. A coated automobile substrate according to claim 99, wherein the automobile substrate is a door.

106. A coated automobile substrate according to claim 99, wherein the automobile substrate is a fender.

107. A multi-component composite coating composition comprising a basecoat deposited from a pigmented coating composition, and a composition according to claim 93 applied over at least a portion of the basecoat.

108. A method for making a multi-component composite comprising:

(a) applying a pigmented composition to a substrate to form a basecoat;

(b) applying a composition according to claim 93 over at least a portion of the basecoat; and

(c) curing the topcoating composition to form a cured composition.

109. A method for improving the scratch resistance of a polymeric substrate or polymer coated substrate comprising applying a composition according to claim 93 over at least a portion of the substrate.

110. A method for retaining the gloss of a polymeric substrate or polymer coated substrate over a predetermined period of time comprising

applying a composition according to claim 93 over at least a portion of the substrate.

111. A method for revitalizing the gloss of a polymeric substrate or polymer coated substrate comprising applying a composition according to claim 92 over at least a portion of the substrate.

112. A composition formed from components comprising:

(a) a polysiloxane comprising at least one reactive functional group, the polysiloxane comprising at least one of the following structural units (I) :

(I) $R^1_nR^2_mSiO_{(4-n-m)/2}$

wherein each R^1, which may be identical or different, represents H, OH, or a monovalent hydrocarbon group; each R^2, which may be identical or different, represents a group comprising at least one reactive functional group; wherein m and n fulfill the requirements of $0<n<4$, $0<m<4$ and $2\leq(m+n)<4$.

provided that when the polysiloxane is a partial condensate of a silanol, then less than 70% by weight of the partial condensate is the partial condensate of $CH_3Si(OH)_3$; and

(b) a plurality of particles having an average particle size of less than 100 nanometers prior to incorporation into the composition,

wherein each component is different, and

wherein the at least one reactive functional group of the at least one polysiloxane is substantially nonreactive with the particles.

113. A composition according to claim 112, wherein the composition when cured has an initial scratch resistance value such that after scratch testing greater than 50 percent of the initial 20° gloss is retained.

114. A composition according to claim 112, wherein the composition when cured has a retained scratch resistance value such that after scratch testing greater than 40 percent of the initial 20° gloss is retained.

115. A composition according to claim 112, wherein the composition when cured has a concentration of particles within a surface region thereof which is greater than a concentration of particles within a bulk region thereof.

116. A cured coating formed from the composition according to claim 112.

117. A coated substrate comprising a substrate and a composition according to claim 112 deposited over at least a portion of the substrate.

118. A method for forming a cured composition on a substrate comprising applying over at least a portion of the substrate a composition according to claim 112, and curing the composition after application to the substrate.

119. A method according to claim 118, wherein the coating composition is thermally cured after application to the substrate.

120. A method according to claim 118, wherein the substrate is an automotive substrate.

121. A coated automobile substrate comprising an automobile substrate and a composition according to claim 112 deposited over at least a portion of the automobile substrate.

122. A coated automobile substrate according to claim 121, wherein the automobile substrate is a bumper.

123. A coated automobile substrate according to claim 121, wherein the automobile substrate is a hood.

124. A coated automobile substrate according to claim 121, wherein the automobile substrate is a door.

125. A coated automobile substrate according to claim 121, wherein the automobile substrate is a fender.

126. A multi-component composite coating composition comprising a basecoat deposited from a pigmented coating composition, and a composition according to claim 112 applied over at least a portion of the basecoat.

127. A multi-component composite according to claim 126, wherein the composition is a topcoat.

128. A multi-component composite according to claim 126, wherein the composition is transparent.

129. A method for making a multi-component composite comprising:

(a) applying a pigmented composition to a substrate to form a basecoat;

(b) applying a composition according to claim 112 over at least a portion of the basecoat; and

(c) curing the composition to form a cured composition.

130. A method for improving the scratch resistance of a polymeric substrate or polymer coated substrate comprising applying a composition according to claim 112 over at least a portion of the substrate.

131. A method for retaining the gloss of a polymeric substrate or polymer coated substrate over a predetermined period of time comprising applying a composition according to claim 112 over at least a portion of the substrate.

132. A method for revitalizing the gloss of a polymeric substrate or polymer coated substrate comprising applying a composition according to claim 112 over at least a portion of the substrate.

133. A powder composition formed from components comprising:

(a) at least one surface active agent comprising:

(i) at least one polysiloxane comprising at least one reactive functional group, the at least one polysiloxane comprising at least one of the following structural units (I) :

(I) $R^1_nR^2_mSiO_{(4-n-m)/2}$

wherein each R^1, which may be identical or different, represents H, OH, a monovalent hydrocarbon group or a monovalent siloxane group; each R^2, which may be identical or different, represents a group comprising at least one reactive functional group, wherein m and n fulfill the requirements of $0<n<4$, $0<m<4$ and $2\leq(m+n)<4$; and

(ii) at least one polyacrylate surface active agent having at least one functional group selected from amino and hydroxyl functionality, acid functionality and acid and hydroxyl functionality; and

(b) a plurality of particles,

wherein each component is different, and

wherein the at least one reactive functional group of the at least one polysiloxane and the at least one functional group of the at least one polyacrylate surface active agent are substantially nonreactive with the particles.